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CLAIMS

1. A composition for increasing the efficiency of introducing a target substance into a cell, comprising:
- 5 (a) an actin acting substance.
2. A composition according to claim 1, wherein the actin acting substance may be an extracellular matrix protein or a variant or fragment thereof.
- 10 3. A composition according to claim 2, wherein the actin acting substance comprises at least one protein selected from the group consisting of fibronectin, laminin, and vitronectin, or a variant or fragment thereof.
- 15 4. A composition according to claim 1, wherein the actin acting substance comprises:
- (a-1) a protein molecule comprising at least amino acids 21 to 241 of SEQ ID NO.: 11 constituting an Fn1 domain,
- 20 or a variant thereof;
- (a-2) a protein molecule having an amino acid sequence set forth in SEQ ID NO.: 2 or 11, or a variant or fragment thereof;
- (b) a polypeptide having an amino acid sequence set forth in SEQ ID NO.: 2 or 11 having at least one mutation selected from the group consisting of at least one amino acid substitution, addition, and deletion, and having a biological activity;
- 25 (c) a polypeptide encoded by a splice or allelic mutant of a base sequence set forth in SEQ ID NO.: 1;
- 30 (d) a polypeptide being a species homolog of the amino acid sequence set forth in SEQ ID NO.: 2 or 11; or
- (e) a polypeptide having an amino acid sequence

having at least 70% identity to any one of the polypeptides (a-1) to (d), and having a biological activity.

5 5. A composition according to claim 1, wherein the Fnl domain comprises amino acids 21 to 577 of SEQ ID NO.: 11.

6. A composition according to claim 1, wherein the protein molecule having the Fnl domain is fibronectin or a variant or fragment thereof.

10 7. A composition according to claim 1, further comprising a gene introduction reagent.

15 8. A composition according to claim 1, wherein the gene introduction reagent is selected from the group consisting of cationic polymers, cationic lipids, and calcium phosphate.

9. A composition according to claim 1, further comprising a particle.

20 10. A composition according to claim 9, wherein the particle comprises gold colloid.

25 11. A composition according to claim 1, further comprising a salt.

12. A composition according to claim 11, wherein the salt is selected from the group consisting of salts contained in buffers and salts contained in media.

30 13. A kit for increasing the efficiency of introducing a target substance into a cell, comprising:

(a) a composition comprising an actin acting

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substance; and

(b) a gene introduction reagent.

14. A composition for increasing the efficiency of
5 introducing a target substance into a cell, comprising:

A) a target substance; and

B) an actin acting substance.

15. A composition according to claim 14, wherein the target
10 substance comprises a substance selected from the group
consisting of DNA, RNA, polypeptides, sugars, and complexes
thereof.

16. A composition according to claim 14, wherein the target
15 substance comprises DNA encoding a gene sequence to be
transfected.

17. A composition according to claim 16, further comprising
a gene introduction reagent.

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18. A composition according to claim 14, wherein the actin
acting substance is an extracellular matrix protein or a
variant or fragment thereof.

19. A composition according to claim 14, wherein the
25 composition is provided in liquid phase.

20. A composition according to claim 14, wherein the
composition is provided in solid phase.

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21. A device for introducing a target substance into a cell,
comprising:

A) a target substance; and

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B) an actin acting substance,

wherein the composition is fixed to a solid phase support.

5 22. A device according to claim 21, wherein the target substance comprises a substance selected from the group consisting of DNA, RNA, polypeptides, sugars, and complexes thereof.

10 23. A device according to claim 21, wherein the target substance comprises DNA encoding a gene sequence to be transfected.

15 24. A device according to claim 23, further comprising a gene introduction reagent.

25 25. A device according to claim 21, wherein the actin acting substance is an extracellular matrix protein or a variant or fragment thereof.

20 26. A device according to claim 21, wherein the solid phase support is selected from the group consisting of plates, microwell plates, chips, glass slides, films, beads, and metals.

25 27. A device according to claim 21, wherein the solid phase support is coated with a coating agent.

30 28. A device according to claim 27, wherein the coating agent comprises a substance selected from the group consisting of poly-L-lysine, silane, MAS, hydrophobic fluorine resins, and metals.

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29. A method for increasing the efficiency of introducing a target substance into a cell, comprising the steps of:

- A) providing the target substance;
- B) providing an actin acting substance; and
- 5 C) contacting the target substance and the actin acting substance with the cell.

30. A method according to claim 29, wherein the target substance comprises a substance selected from the group consisting of DNA, RNA, polypeptides, sugars, and complexes thereof.

31. A method according to claim 29, wherein the target substance comprises DNA encoding a gene sequence to be transfected.

32. A method according to claim 31, further comprising providing a gene introduction reagent, wherein the gene introduction reagent is contacted with the cell.

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33. A method according to claim 29, wherein the actin acting substance is an extracellular matrix protein or a variant or fragment thereof.

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34. A method according to claim 29, wherein the steps are conducted in liquid phase.

35. A method according to claim 29, wherein the steps are conducted in solid phase.

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36. A method for increasing the efficiency of introducing a target substance into a cell, comprising the steps of:

- I) fixing a composition to a solid support, wherein

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the composition comprising:

A) a target substance; and

B) an actin acting substance; and

II) contacting the cell with the composition on the
5 solid support.

37. A method according to claim 36, wherein the target
substance comprises a substance selected from the group
consisting of DNA, RNA, polypeptides, sugars, and complexes
10 thereof.

38. A method according to claim 36, wherein the target
substance comprises DNA encoding a gene sequence to be
transfected.

15 39. A method according to claim 38, further comprising
providing a gene introduction reagent, wherein the gene
introduction reagent is contacted with the cell.

20 40. A method according to claim 39, further comprising
forming a complex of the DNA and the gene introduction reagent
after providing the gene introduction reagent, wherein after
the forming step, the composition is provided by providing
the actin acting substance.

25 41. A method according to claim 36, wherein the actin acting
substance is an extracellular matrix protein or a variant
or fragment thereof.